



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,819	03/03/2004	Munetaka Kakiuchi	249935US0X	1495

22850 7590 04/20/2006

OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

SHOSHO, CALLIE E

ART UNIT	PAPER NUMBER
----------	--------------

1714

DATE MAILED: 04/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/790,819	Applicant(s) KAKIUCHI ET AL.	
	Examiner Callie E. Shosho	Art Unit 1714	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>4/22/04 & 7/19/04</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(a) Claims 1 and 3-5 each recite “urethane type resin”. The scope of the claim is confusing because it is not clear what is meant by “urethane type” resin. The addition of the word “type” extends the scope of the claims so as to render them indefinite since it is unclear what “type” is intended to convey. The addition of the word “type” to the otherwise definite expression renders the definite expression indefinite by extending its scope. *Ex parte Copenhaver*, 109 USPQ 118 (Bd. App. 1955).

(b) Claim 1 recites “dispersion particle size D50”. The scope of the claim is confusing because it is not clear what is meant by the abbreviation “D50” or what type of particle size this represents.

(c) Claim 6, which is drawn to aqueous recording liquid and depends on claim 1, recites “wherein a solid-printed part having 14.5 mg per square inch of a pigment dispersed aqueous recording liquid...provides printed thickness of at least 20 nm, an optical density of at least 2, and 20⁰ gloss value of at least 60. The scope of the claim is confusing in light of the use of “a”

before “pigment-dispersed aqueous recording liquid” in line 3 given that it is not clear if this is the same ink as disclosed in claim 1. If the ink is the same as that disclosed in claim 1, it is advised that “a” is changed to “the” in line 3.

Further, the scope of the claim is confusing because it is not clear what is being claimed an aqueous recording liquid or solid-printed part. Similar questions arise in claim 14 which is also drawn to aqueous recording liquid but describes a solid printed part.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 3-4, 6-7, 9-10, and 13-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Nichols et al. (U.S. H2113).

Nichols et al. disclose pigment dispersed aqueous recording liquid comprising 0.5-10% water-dispersible polyurethane, i.e. polyurethane resin emulsion, and 4-8% pigment which has dispersion average particle size of less than 0.1 μm and includes carbon black. The resin emulsion comprises 17-60% polyurethane wherein the polyurethane possesses weight average molecular weight of 1,500-100,000 and acid value of 5-70. There is no disclosure that the

polyurethane contains urea. It is disclosed that mixtures of pigments are utilized. It is calculated that the ratio of polyurethane to pigment is $0.01 \left(\frac{0.17 \times 0.5}{8} \right) - 1.5 \left(\frac{0.6 \times 10}{4} \right)$ which clearly overlaps the presently claimed ratio of polyurethane to pigment of $0.6 \left(\frac{60}{100} \right) - 2 \left(\frac{200}{100} \right)$. It is further disclosed that the ink is printed by ink jet printer onto substrate to produce printed material (col.1, lines 46-50 and 57-60, col.3, line 63-col.4, line 5, col.4, lines 16-18 and 24-27, col.6, lines 10-15, col.7, lines 1-3, col.10, lines 8-15 and 58, col.11, lines 41-42 and 45-47, and col.12, lines 29-51).

Given that Nichols et al. disclose recording liquid identical to that presently claimed, it is clear that a solid-printed part having 14.5 mg per square inch of the recording liquid printed on photographic image quality paper would inherently provide printed thickness of at least 20 nm, optical density of at least 2, and 20^0 gloss value of at least 60 as required in present claim 14.

In light of the above, it is clear that Nichols et al. anticipate the present claims.

5. Claims 1-6, 9-10, and 13-15 are rejected under 35 U.S.C. 102(b) as being anticipated by EP 1167466.

EP 1167466 discloses pigment dispersed aqueous ink jet ink comprising 1-10% pigment such as carbon black possessing DBP not less than 60 ml/100 g wherein the pigment has dispersion average particle diameter of 50-200 nm, 5-200%, based on amount of pigment, water-dispersible polyurethane possessing weight average molecular weight of 5,000-45,000 and acid value of 55-150, and other resin which is anionic water-soluble polymer possessing acid value of not less than 150. There is no disclosure that the polyurethane contains urea. There is also

disclosed ink jet printing method wherein the ink is printed onto substrate such as gloss paper in order to form printed material (paragraphs 1, 9, 12, 15-16, 24, 34, 41, 53, 55-56, and 58-59).

Given that EP 1167466 discloses recording liquid identical to that presently claimed, it is clear that a solid-printed part having 14.5 mg per square inch of the recording liquid printed on photographic image quality paper would inherently provide printed thickness of at least 20 nm, optical density of at least 2, and 20^0 gloss value of at least 60 as required in present claim 14.

In light of the above, it is clear that EP 1167466 anticipates the present claims.

6. Claims 1, 3-7, 9-10, and 13-15 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 00/52106 taken in view of the evidence given in Fuchs (U.S. 6,383,644).

WO 00/52106 discloses pigment dispersed aqueous ink jet ink comprising 0.01-10%, preferably, 2-4% hydrophilic acrylic polymer possessing acid value of 30-200, 0.1-10%, preferably, 4-7% hydrophobic polymer that is water-dispersible polyurethane possessing number average molecular weight of less than 40,000, and 0.1-15%, preferably, 4-8% pigment having dispersion average particle size of 10-30 nm such as carbon black. It is disclosed that mixtures of pigments are utilized. There is also disclosed ink jet printing method wherein the ink is printed onto substrate such as gloss paper in order to form printed material. While WO 00/52106 discloses that the polyurethane is chain extended with polyamine, it is noted that such chain extension is optional and thus, the weight fraction of a polyurethane urea part is clearly less than 2 wt%. It is calculated that the ratio of polyurethane to pigment is 0.5 (4/8) to 1.75 (7/4) which clearly overlaps the presently claimed ratio of polyurethane to pigment of 0.6 (60/100) – 2 (200/100). Attention is drawn to examples 3-6 that utilize water-dispersible polyurethane known

under the tradename NeoRez R985 which is well known, as evidenced by Fuchs (Table 1), to possess acid value of 20.5 (page 1, lines 1-2 and 28-35, page 3, lines 18-20 and 25-27, page 9, lines 21-32 and 38-40, page 11, lines 14-35, page 12, lines 1-3 and 30-38, page 13, lines 1-10, and page 14, lines 9-26 and 37-40). While WO 00/52106 discloses the number average molecular weight (M_n) of the water-dispersible polyurethane and not weight average molecular weight (M_w) as presently claimed, given the relationship between M_n and M_w , i.e. $M_w/M_n > 1$, it is clear that the weight average molecular weight would overlap that presently claimed.

Given that WO 00/52106 discloses recording liquid identical to that presently claimed, it is clear that a solid-printed part having 14.5 mg per square inch of the recording liquid printed on photographic image quality paper would inherently provide printed thickness of at least 20 nm, optical density of at least 2, and 20° gloss value of at least 60 as required in present claim 14.

In light of the above, it is clear that WO 00/52106 anticipates the present claims.

7. Claims 1, 3-4, 6, 9-10, and 13-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Valentini et al. (U.S. 2003/0184629).

Valentini et al. disclose pigment dispersed aqueous ink jet ink comprising 0.01-10% pigment possessing dispersion average particle size of 5-300 nm and 0.2-4% water-dispersible polyurethane dispersion wherein the polyurethane possesses weight average molecular weight of more than 30,000 and acid number of about 20-30. It is calculated that the ratio of polyurethane to pigment is 0.02 (0.2/10) – 40 (4/0.1) which clearly overlaps the presently claimed ratio of polyurethane to pigment of 0.6 (60/100) – 2 (200/100). It is disclosed that the polyurethane optionally contains urea groups. There is also disclosed ink jet printing method wherein the ink is

printed onto substrate in order to form printed material (paragraphs 2, 20, 23, 28, 33-35, 73, 81, 83, 85, 101, 159, and claim 12). Given that Valentini et al. disclose recording liquid identical to that presently claimed, it is clear that a solid-printed part having 14.5 mg per square inch of the recording liquid printed on photographic image quality paper would inherently provide printed thickness of at least 20 nm, optical density of at least 2, and 20^0 gloss value of at least 60 as required in present claim 14.

In light of the above, it is clear that Valentini et al. anticipate the present claims.

8. Claims 1, 6, 9-10, and 14 are rejected under 35 U.S.C. 102(e) as being anticipate by Pearlstine et al. (U.S. 2004/0092622).

Pearlstine et al. disclose pigment dispersed aqueous ink jet ink comprising polyurethane dispersion and pigment possessing dispersion average particle size of 5-300 nm wherein the ratio of pigment to polyurethane is less than 2.5. It is disclosed that the polyurethane optionally contains urea groups. There is also disclosed ink jet printing method wherein the ink is printed onto substrate such as photoglossy paper in order to form printed material. Attention is drawn to example 1 which discloses ink comprising 1.5% pigment with dispersed average particle size of 92 nm and 0.35% water-dispersible polyurethane wherein the ink has 20 gloss of 66.7 and it is calculated that the ratio of polyurethane to pigment is 0.24 (0.35/1.5) (paragraphs 3, 7-8, 13, 20, 22-24, 68, 74, and 90). Given that Pearlstine et al. disclose recording liquid identical to that presently claimed including possessing 20^0 gloss as presently claimed, it is clear that a solid-printed part having 14.5 mg per square inch of the recording liquid printed on photographic

image quality paper would inherently provide printed thickness of at least 20 nm and optical density of at least 2 as required in present claim 14.

In light of the above, it is clear that Pearlstine et al. anticipate the present claims.

9. Claims 14-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Shinozuka et al. (U.S. 5,750,592).

Shinozuka et al. disclose pigment-dispersed aqueous ink jet ink comprising 0.2-20% water-dispersible polyurethane possessing acid value of 45-100 and pigment possessing dispersion particle size of less than 1000 nm such as carbon black. It is disclosed that the ratio of polyurethane to pigment is 0.25-10. There is disclosed ink jet printing method wherein the ink is printed onto transfer drum and then onto substrate in order to form printed material. There is also disclosed printed material comprising the ink in thickness of 2-10 μm that possesses optical density of greater than 1.4 (col.1, lines 6-8, col.2, line 59-col.3, line 5, col.3, lines 29-30 and 34-48, col.5, lines 18-19 and 48-55, col.7, lines 37-42, and col.8, lines 55-60). Given that Shinozuka et al. disclose printed material identical to that presently claimed, i.e. obtained from pigment and water-dispersible polyurethane wherein the printed material comprises printed ink thickness and optical density as presently claimed, it is clear that the ink would inherently possess 20⁰ gloss as presently claimed. Further, given that the thickness is the same as presently claimed, it is clear that the same amount of ink, i.e. at least 14.5 mg per square inch, must be deposited onto the substrate.

In light of the above, it is clear that Shinozuka et al. anticipate the present claims.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nichols et al. (U.S. H 2113); WO 00/52106, or Valentini et al. (U.S. 2003/0184629) any of which in view of Suzuki et al. (U.S. 6,245,832).

The disclosures with respect to Nichols et al., WO 00/52106, and Valentini et al. in paragraphs 4, 6, and 7 above are incorporated here by reference.

The difference between Nichols et al., WO 00/52106, or Valentini et al. and the present claimed invention is the requirement in the present claim of specific carbon black.

Suzuki et al., which is drawn to ink jet ink, disclose the use of carbon black possessing DBP value of 50-80 ml/100 g and discloses that if the value is less than 50 ml/100 g, dispersibility is deteriorated and if the value is greater than 80 ml/ 100 g, the viscosity of the ink increases and thus the ejection property of the ink tends to turn worse (col.6, lines 10-16).

In light of the motivation for using carbon black with specific DBP disclosed by Suzuki et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such carbon black in the ink of Nichols et al., WO 00/52106, or Valentini et al. in order to produce ink with well dispersed carbon black that ejects properly from the printer, and thereby arrive at the claimed invention.

12. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nichols et al. (U.S. H 2113), Valentini et al. (U.S. 2003/0184629), or Pearlstine et al. (U.S.2004/0092622) any of which in view of EP 1167466.

The disclosures with respect to Nichols et al., Valentini et al., and Pearlstine et al. in paragraphs 4, 7, and 8 above are incorporated here by reference.

The difference between Nichols et al., Valentini et al., or Pearlstine et al. and the present claimed invention is the requirement in the present claim of the use of additional resin.

EP 1167466, which is drawn to ink jet ink, disclose the use of anionic water-soluble polymer having acid value not less than 150 in order to improve the storage stability, waterfastness, and rubbing resistance of the ink (paragraph 41).

In light of the motivation for using additional resin disclosed by EP 1167466 as described above, it therefore would have been obvious to one of ordinary skill in the art to use such resin in the ink of Nichols et al., Valentini et al., or Pearlstine et al. in order to produce ink with improved the storage stability, waterfastness, and rubbing resistance, and thereby arrive at the claimed invention.

13. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nichols et al. (U.S. H2113) or WO 00/52106 either of which in view of EP 1219689.

The disclosures with respect to Nichols et al. and WO 00/52106 in paragraphs 4 and 6 above are incorporated here by reference.

The difference between Nichols et al. or WO 00/52106 and the present claimed invention is the requirement in the present claims of the use of carbon black and cyan pigment.

EP 1219689, which is drawn to ink jet ink, discloses adding cyan pigment to ink containing carbon black in order to modify yellowing property of the carbon black (paragraphs 3, 5, and 7).

In light of the motivation for using cyan pigment with carbon black disclosed by EP 1219689 as described above, it therefore would have been obvious to one of ordinary skill in the

Art Unit: 1714

art to use cyan pigment in the ink of Nichols et al. or WO 00/52106 in order to reduce yellowing of the ink, and thereby arrive at the claimed invention.

14. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 1167466 in view of EP 1219689.

The disclosure with respect to EP 1167466 in paragraph 5 above is incorporated here by reference.

The difference between EP 1167466 and the present claimed invention is the requirement in the claims of specific pigment.

EP 1167466 discloses use of carbon black, however, there is no disclosure of the use of cyan pigment.

EP 1219689, which is drawn to ink jet inks, discloses adding cyan pigment to ink containing carbon black in order to modify yellowing property of the carbon black (paragraphs 3, 5, and 7).

In light of the motivation for using cyan pigment with carbon black disclosed by EP 1219689 as described above, it therefore would have been obvious to one of ordinary skill in the art to use cyan pigment in the ink of EP 1167466 in order to reduce yellowing of the ink, and thereby arrive at the claimed invention.

15. Claims 1, 4, 6, and 9-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shinozuka et al. (U.S. 5,750,592) in view of either Sawada et al. (U.S. 5,772,746) or Chen et al. (U.S. 6,848,777).

Shinozuka et al. disclose pigment-dispersed aqueous ink jet ink comprising 0.2-20% water-dispersible polyurethane possessing acid value of 45-100 and pigment possessing dispersion particle size of less than 1000 nm such as carbon black. It is disclosed that the ratio of polyurethane to pigment is 0.25-10. There is disclosed ink jet printing method wherein the ink is printed onto transfer drum and then onto substrate in order to form printed material. There is also disclosed printed material comprising the ink in thickness of 2-10 μm that possesses optical density of greater than 1.4 (col.1, lines 6-8, col.2, line 59-col.3, line 5, col.3, lines 29-30 and 34-48, col.5, lines 18-19 and 48-55, col.7, lines 37-42, and col.8, lines 55-60).

The difference between Shinozuka et al. and the present claimed invention is the requirement in the claims of specific average particle size of the dispersed pigment.

Shinozuka et al. disclose the use of pigment possessing dispersion average particle size less than 1000 nm but there is no explicit disclosure of the use of pigment possessing dispersion average particle size of 40-100 nm as presently claimed.

Sawada et al., which is drawn to ink jet ink, disclose the use of pigment possessing dispersion average particle size of less than 100 nm in order to produce ink with better splash property and better storage stability (col.3, lines 25-26, 29-31, and 33-37).

Alternatively, Chen et al., which is drawn to ink jet inks, disclose the use of pigment possessing dispersion average particle size of less than 200 nm in order that the ink can be jetted through the print head of the printer (col.4, lines 26-30).

Given that Shinozuka et al. in combination with Sawada et al. or Chen et al. disclose ink identical to that presently claimed, i.e. obtained from pigment and water-dispersible polyurethane in amounts as presently claimed wherein the printed material obtained from the ink comprises

printed ink thickness and optical density as presently claimed, it is clear that the ink would intrinsically possess 20⁰ gloss and the printed material would intrinsically possess surface roughness as presently claimed. Further, given that the thickness is the same as presently claimed, it is clear that the same amount of ink, i.e. at least 14.5 mg per square inch, must be deposited onto the substrate.

In light of the motivation for using pigment with specific dispersion average particle size disclosed by Sawada et al. or Chen et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use pigment with such particle size in the ink of Shinozuka et al. in order to produce ink with good splash property and storage stability, or alternatively, in order to produce ink that would not clog printer, and thereby arrive at the claimed invention.

16. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shinozuka et al. in view of either Sawada et al. or Chen et al. as applied to claims 1, 4, 6, and 9-17 above, and further in view of Suzuki et al. (U.S. 6,245,832).

The difference between Shinozuka et al. in view of either Sawada et al. or Chen et al. and the present claimed invention is the requirement in the present claim of specific carbon black.

Suzuki et al., which is drawn to ink jet ink, disclose the use of carbon black possessing DBP value of 50-80 ml/100 g and discloses that if the value is less than 50 ml/100 g, dispersibility is deteriorated and if the value is greater than 80 ml/ 100 g, the viscosity of the ink increases and thus the ejection property of the ink tends to turn worse (col.6, lines 10-16).

In light of the motivation for using carbon black with specific DBP disclosed by Suzuki et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such carbon black in the ink of Shinozuka et al. in order to produce ink with well dispersed carbon black that ejects properly from the printer, and thereby arrive at the claimed invention.

17. Claims 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shinozuka et al. in view of either Sawada et al. or Chen et al. as applied to claims 1, 4, 6, and 9-17 above, and further in view of EP 1167466.

The difference between Shinozuka et al. in view of either Sawada et al. or Chen et al. and the present claimed invention is the requirement in the claims of (a) weight average molecular weight of polyurethane and (b) use of additional resin.

With respect to difference (a), EP 1167466, which is drawn to ink jet ink, disclose the use of water-dispersible polyurethane possessing weight average molecular weight of 5,000-45,000 in view of stability of jetting performance (paragraphs 9, 24, and 34).

In light of the motivation for using polyurethane with specific weight average molecular weight disclosed by EP 1167466 as described above, it therefore would have been obvious to one of ordinary skill in the art to use polyurethane with such weight average molecular weight in the ink of Shinozuka et al. in order to produce ink with stable jetting performance, and thereby arrive at the claimed invention.

With respect to difference (b), EP 1167466, which is drawn to ink jet ink, disclose the use of anionic water-soluble polymer having acid value not less than 150 in order to improve the storage stability, waterfastness, and rubbing resistance of the ink (paragraph 41).

In light of the motivation for using additional resin disclosed by EP 1167466 as described above, it therefore would have been obvious to one of ordinary skill in the art to use such resin in the ink of Shinozuka et al. in order to produce ink with improved the storage stability, waterfastness, and rubbing resistance, and thereby arrive at the claimed invention.

18. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shinozuka et al. in view of Sawada et al. or Chen et al. as applied to claims 1, 4, 6, and 9-17 above, and further in view of EP 1219689.

The difference between Shinozuka et al. in view of Sawada et al. or Chen et al. and the present claimed invention is the requirement in the claims of specific pigment.

Shinozuka et al. discloses use of carbon black, however, there is no disclosure of the use of cyan pigment.

EP 1219689, which is drawn to ink jet inks, discloses adding cyan pigment to ink containing carbon black in order to modify yellowing property of the carbon black (paragraphs 3, 5, and 7).

In light of the motivation for using cyan pigment with carbon black disclosed by EP 1219689 as described above, it therefore would have been obvious to one of ordinary skill in the art to use cyan pigment in the ink of Shinozuka et al. in order to reduce yellowing of the ink, and thereby arrive at the claimed invention.

Art Unit: 1714

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

EP 1270251, Chen et al. (U.S. 6,908,185), and McCovick (U.S. 2004/0110867) each disclose ink jet ink comprising dispersed pigment and water-dispersible polyurethane, however, there is no disclosure of the dispersion particle size D50 of the pigment as presently claimed or any disclosure that the ink produces printed material comprising print thickness, optical density, and 20⁰ gloss value as presently claimed.

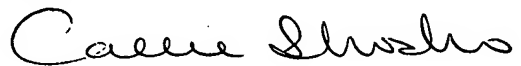
Rao et al. (U.S. 2004/0041891) disclose printed material printed by ejecting ink onto substrate wherein the ink comprises optical density of at least 2 and 20⁰ gloss value of at least 60, however, there is no disclosure or suggestion of print thickness as presently claimed.

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 571-272-1123. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1714

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Callie E. Shosho
Primary Examiner
Art Unit 1714

CS
4/14/06